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10/17/2000

ALAIN BETHUNE

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EXAMINER

MCCLELLAND, KIMBERLY KEIL

ART UNIT

PAPER NUMBER

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 09/688,961  
Filing Date: October 17, 2000  
Appellant(s): BETHUNE, ALAIN

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Leana Levin  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 12/19/2006 appealing from the Office action mailed 1/27/06.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

Claims 44, 45, 58, and 59 are allowed.

Claims 11 and 36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**(4) Status of Amendments After Final**

No amendment after final has been filed.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

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**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

JP 01-202492	DOI et al.	08-1989
4,294,641	REED et al.	10-1981
4,133,723	HOWARD	01-1979
5,391,247	KAMEN et al.	02-1995
1,124,869	DAVIS et al.	01-1915

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 1, 4-10, 12, 13, 21, 24-26, 29-35, 37-39, 41, 46, 47, 56, 57, 60, and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doi et al. (JP 01-202492) in view of Reed et al. (US Patent No. 4,294,641).

Regarding claims 1, 26, 46, and 47, Doi et al. disclose a method of decorating a substrate comprising the steps of (Translation of Cited Reference 1):

(1) Supplying a multilayer structure comprising a release sheet (backing), a layer of radiation curable protective resin (varnish), a decorative layer, and a layer of heat activated adhesive;

(2) Exposing the protective resin layer to radiation to render it partially cured;

(3) Contacting the multilayer structure with the surface of a target substrate;

(4) Applying pressure and heat with a heated roller thereby activating the heat activated adhesive layer to bond the decorative and protective resin layers to the target substrate;

(5) Withdrawing the release sheet; and

(6) Exposing the transferred layers to further radiation causing the protective resin layer to fully cure whereby the transferred layers remain on the surface of the target substrate.

Doi discloses that the protective resin layer is curable by UV radiation, but does not disclose a UV thermal varnish which is also cured with heat prior to transfer. Instead, Doi shows the varnish layer being partially cured by radiation prior to transfer.

Reed, also drawn to a method of decorating a substrate by the thermal transfer, discloses a method comprising the steps of: (1) Providing a transfer sheet comprising,

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in order, a support sheet (backing layer), a transfer resin layer (varnish layer) that cures under the effect of radiation, and a design (decoration) layer (column 7, lines 22-40); (2) Bringing the transfer sheet into contact with an article to be decorated (column 9, lines 3-30); (3) Applying localized pressure and heat to the carrier sheet to transfer a localized portion of the resin and design layer to the article (column 9, lines 31-42); (4) Removing the carrier sheet (column 14, lines 45-47); and (5) Causing the resin layer that has been transferred to the article to harden (cure) by exposing it to radiation to thereby produce, an article having a decoration applied thereto (column 14, lines 48-55).

As per claims 1, 4, 26 and 29, Reed discloses that the transfer layer comprises a UV or thermally curable hydroxylated urethane acrylate such as acrylated polyurethane (column 6, lines 5-12; column 14, line 20). It would have been obvious to one having ordinary skill in the art at the time the invention was made that an alternative to the UV varnish used in Doi would be a UV thermal varnish such as the one used in Reed, because one of ordinary skill in the art would appreciate the functionality of using a varnish capable of being cured by either heat or UV radiation. Furthermore, both Doi and Reed are drawn to methods for the thermal transfer decoration of substrate utilizing a transfer sheet having a transferable outer protective layer which may be UV cured after transfer to provide a rugged and durable decoration.

As per claims 5, 30, 46, and 47, Reed discloses that the transfer layer includes acrylated polyurethane, a low molecular-weight prepolymer oligomer (column 14, line 21).

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As per claims 7 and 32, Reed discloses that the transfer layer may include pigments (column 14, lines 40-44).

As per claims 8 and 33, Reed discloses that the transfer layer includes photo-initiators at a concentration of 2.47 wt% (column 14, lines 22-24).

As per claims 13 and 38, Reed discloses that the design layer is a layer of ink deposited by printing onto the transfer layer prior to the exposure of the transfer layer to UV curing (column 7, lines 28-51). It would have been obvious to one of ordinary skill in the art at the time of invention to substitute the metallic decorative layer of Doi with the printed in decoration layer of Reed, because that such a substitution would enable increase the decorative and aesthetic possibilities of the Doi methodology.

Although Reed discloses that the transfer layer includes photo-initiators at a concentration of 2.47 wt%, they do not specifically disclose, as per claims 21 and 39, that the photo-initiators are present at a concentration by weight of about 0.5%.

Nonetheless, it would have been obvious to one of ordinary skill in the art at the time of invention to utilize any effective amount of photo-initiator in compounding the transfer layer of Reed, for use in the method of Doi, because the claimed amount of photo-initiator would have been the result of routine experimentation by one of ordinary skill in the art taking into consideration the polymers utilized and the method and means of UV exposure.

Regarding claims 6 and 31, Doi discloses that the protective resin layer applied to the release sheet contains MEK, a solvent.

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Regarding claims 9 and 34, Doi discloses that the release sheet comprises a polyester film.

Regarding claims 10 and 35, Doi discloses that the decorative layer is covered by a layer of heat activated (hot-melt) adhesive.

Regarding claim 24, Doi discloses that the transferred layers remain coherent as a rugged surface.

Regarding claims 25 and 41, Doi discloses that the substrate may comprise a resin, i.e., a plastic article.

Regarding claims 12, 37, 56, and 57, Doi discloses, as per claims 12 and 37, that the transfer sheet may include a thin layer of metal applied via vacuum to the protective (varnish) layer prior to the steps of transfer and full UV cure ("Effects of the Invention" section). Although Doi discloses in their example that the protective layer undergoes a partial half-cure via UV radiation prior to metallization, it would have been obvious to one of ordinary skill in the art at the time of invention, as per claims 56 and 57, that the protective resin layer of Doi could be vacuum metallized without the exemplified UV half-curing step, because Doi also disclose that the protective layer, after coating and drying (but before half or full cure), is solid in its uncured state ("Protecting Layer" section).

Claims 3 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doi in view of Reed as applied to claims 1 and 26 above, and further in view of Hekal et al. (US Patent No. 5,581,978).



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Doi in view of Reed, as combined above, discloses that the transfer layer comprises a UV or thermally curable hydroxylated urethane acrylate such as acrylated polyurethane, they do not specifically disclose, as per claims 3 and 28, that the UV or thermally curable resin is based on a cationic system.

Hekal, also drawn to UV curable coatings, disclose that materials which work well for UV curable overcoatings include acrylated urethane, two part epoxy and urethane systems, and cationic systems (column 5, lines 13-19).

It would have been obvious to one of ordinary skill in the art at the time of invention to substitute a UV curable cationic resin for the acrylated polyurethane disclosed by Doi in view of Reed, because such compositions are interchangeable functionally equivalent alternative expedient as suggested by Hekal.

Claims 22 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doi in view of Reed as applied to claims 1, 5, 26, and 30 above, and further in view of Howard et al. (US Patent No. 4,133,723).

Although Doi in view of Reed discloses that the transfer layer comprises a low molecular weight oligomer such as UV or thermally curable acrylated polyurethane, they do not specifically disclose, as per claims 22 and 40, that the molecular weights lie in a range from 800 to about 2000.

It would have been obvious to one of ordinary skill in the art at the time of invention to utilize a low molecular weight oligomer such as an acrylated polyurethane having a molecular weight within the claimed range, because Howard, also drawn to

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radiation curable coatings, discloses that acrylated urethane oligomers having molecular weights ranging from 410 to 1000 (Table I) are useful in forming radiation curable coatings (abstract).

Claims 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doi in view of Reed as applied to claims 1 and 26 above, and further in view of Kamen et al. (US Patent No. 5,391,247) and Davis et al. (US Patent No. 1,124,869).

Doi in view of Reed discloses that the transfer is accomplished by the application of pressure and heat with a heated roller thereby activating the heat activated adhesive layer to bond the decorative and protective resin layers to the target substrate.

Davis, also drawn to methods for the hot- marking of substrates with a heat-transfer film, discloses that a pattern of decorative material (gold leaf) may be transferred to a substrate through the use of a relief-patterned gilding iron, (Figures 1 and 3; page 1, column 1, line 32 to column 2, line 90).

It would have therefore been obvious to one of ordinary skill in the art at the time of invention to utilize a relief-patterned gilding iron (a stamp), such as that taught by Davis, in place of the heated roller of Doi in view of Reed, because Kamen, also drawn to methods for the hot- marking of substrates with a heat-transfer films, disclose that the transfer film may be compressed against the substrate by means of a stamp, roller or any other suitable instrument known in the art for this purpose (column 3, lines 6-9).

**(10) Response to Argument**

Applicant argues in on pages 11-12 of the appeal brief that neither Doi nor Reed, either alone or in combination, teach or suggest that the varnish is partially cured by exposure to heat prior to transfer. It is appreciated that Doi teaches partial curing by radiation, but does not teach using heat. For that feature, Reed was relied on, because Reed teaches it is possible to cure either with radiation or with heat. The secondary reference is relied upon to teach that uv and heat are used interchangeably. It is further noted that the uv curing step of the primary reference would give off some amount of heat. Applicant argues that since Reed teaches that the resin layer is transferred in liquid phase, it cannot be used in combination with Doi. However, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

With respect to applicant's assertion that Doi and Reed are drawn to different inventions, this argument is not persuasive. Both Doi and Reed are drawn to methods for the thermal transfer decoration of substrate utilizing a transfer sheet having a transferable outer protective layer which may be UV cured after transfer to provide a rugged and durable decoration. One skilled in the art desiring to improve the capabilities of the transfer sheet in Doi would look to the teachings of Reed to use the alternative radiation and heat curable varnish.

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As discussed at the bottom of page 12, applicant argues there is no motivation to use the alternative radiation and heat curable varnish of Reed for the UV varnish disclosed in Doi. Action dated 6/9/03 discloses the motivation would have been to improve the functionality of the varnish by using a varnish capable of being cured by either heat or UV radiation.

Applicant's remaining remarks against the present rejection of claims 3-10, 12-13, 21-22, 24-25, 28-35, 37-43, 46-47, 56-57, and 60-61 (page 13) are based on the arguments against the rejection of independent claims 1 and 26 over Doi in view of Reed, and are not separately argued.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Kim McClelland

A handwritten signature in black ink, appearing to read "Kim McClelland", written in a cursive style.

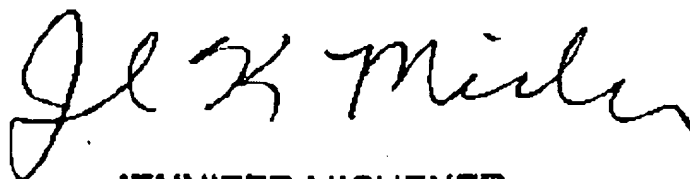
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